A Cohort Study of the Impact of a National Disease Management Program on HEDIS Diabetes Outcomes

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ABSTRACT

Diabetes disease management programs (DDMP) are proliferating, but their overall impact in improving quality of care using Health Employer Data and Information Set (HEDIS) quality metrics has not been well studied. Furthermore, DDMPs are usually ongoing, but the incremental benefits of continuing the program beyond the initial patient educational intervention have not been rigorously tested. This study evaluates the impact of length of DDMP participation on diabetes-related HEDIS 2002 quality indicators across 20 health plans. Results are stratified by duration of DDMP participation into three levels, “full participants” (6–12 months duration), “partial participants” (<6 months duration) and “non-participants” (0 months duration). The overall national compliance rate across all six combined HEDIS quality measures was 65.6% among full-participants (FP), 58.4% among partial-participants (PP) and 57.0% among non-participants (NP). This study demonstrates that participants in a comprehensive DDMP fair better than non-participants and that those with sustained participation (>6 months) benefit the most. (Disease Management 2005;8:86–92)

INTRODUCTION

Diabetes is a serious disease affecting 16 million Americans.1 The dramatic increase in the incidence of diabetes,2,3 represents a serious public health concern. Risk factors for diabetes, including inactivity,4 obesity,5 and the aging population, are also on the rise, threatening an even greater burden of cost and illness in the future. In spite of known effective treatments to delay or avoid the complications of diabetes, there is a gap between the care patients with diabetes should receive and what they actually get.6 Barriers to greater physician use of guidelines and to poor patient adherence to recommended treatments and behavior change are complex.7–9 Diabetes disease management programs (DDMP) have been shown to narrow the gaps in quality related to incomplete patient and physician adherence to national standards of care through enhanced patient self-care and physician feedback.10 DDMP can achieve sustained lifestyle changes11 and improved clinical outcomes.12 However, the impact of a national program among DDMP participants on improving diabetes-related Health Employer Data and Information Set (HEDIS) rates, a required feature of health plan accreditation by the National Committee for Quality Assurance (NCQA), com-

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pared to the absence of the DDMP has not been examined in detail. Furthermore, most disease management programs are ongoing, but the incremental effect of length of program participation on outcomes beyond the initial patient education phase (first 6 months) is not known.

This study is a retrospective, controlled cohort study of the impact of a national DDMP on diabetes-related HEDIS 2002 (calendar year 2001) quality indicators across 20 health plans, all affiliated with the same national managed care organization (MCO). Results were stratified by duration of DDMP participation into three levels, “full-participants” (6–12 months duration), “partial-participants” (<6 months duration) and “non-participants” (0 months duration). The DDMP was implemented under “real-world” conditions rather than as an experiment. The DDMP was implemented under “real-world” conditions rather than as an experiment. For this reason, the allocation of members to DDMP participation was not random. The main purpose of the study was to answer two questions: (1) Did participants in the DDMP perform better than non-participants in the 2002 HEDIS results? (2) Did duration of patient participation in the DDMP program beyond the first 6 months result in an incremental benefit?

**MATERIALS AND METHODS**

*Site selection and patient participation*

By January 2001, a national managed care organization (MCO) had offered a DDMP across multiple health plans to members enrolled in its MCO’s Commercial Health Maintenance Organization (HMO) plans and Point-of-Service (POS) plans whose self-insured employers elected to cover the DDMP. Individual patient participation in the DDMP was voluntary. All eligible patients could choose to opt-out of the program or change their level of participation anytime. Simultaneously, health plans seeking NCQA accreditation collected and eventually reported HEDIS 2002 results using NCQA standard methodology. This provided a unique opportunity to examine the diabetes-related HEDIS rates among the subset of members who had participated in the DDMP and compare them with those who had not participated.

To be categorized as a full-participant (FP) in the DDMP, a member must have been an active participant for at least 6 months in calendar year 2001. Members participating for less than 6 months were considered partial-participants (PP). Non-participant (NP) members were those members whose employers declined coverage for the DDMP benefit, or elected to opt-out of the DDMP (76.6% of all NP), or had not yet been offered the DDMP due to recent acquisition (24.4% of all NP). Benefit coverage for the DDMP is an administrative decision usually made by the company’s employee benefit manager. The program is not available to individual members as a buy-up option. The study schema is shown in Figure 1.

**HEDIS methodology**

The HEDIS methodology employed, referred to as the “hybrid method,” is based on predefined administrative data queries of medical claims supplemented by chart reviews of representative, random samples of generally 411 eligible members diagnosed with diabetes mellitus per each health plan. The six diabetes-related HEDIS measures analyzed were (1) HbA1c Testing Rate, (2) HbA1c Control Rate, (3) LDL-C Screening Rate, (4) LDL-C Level Rate, (5) Eye Exams Rate, and (6) Nephropathy Monitoring Rate. Data from all health plans that offered the DDMP and reported HEDIS results to the public were included in this analysis.

**Diabetes-related HEDIS metrics definitions**

*HbA1c testing rate.* Regulating insulin levels in the blood is key to proper diabetes maintenance. The American Diabetes Association recommends an annual Glycohemoglobin Blood Test (HbA1c) test in order to determine the average blood glucose level over the past 120 days. This measure assesses the percentage of diabetics receiving an annual HbA1c blood test.

*HbA1c control rate.* This measure assesses the percentage of diabetics who had poorly controlled diabetes (HbA1c > 9.5%). The rates have been inverted to show well-controlled diabetes.
**LDL-C screening rate.** High cholesterol levels in the blood have been directly linked to coronary heart disease. This represents an added health risk for persons with diabetes. Specifically, high levels of low-density lipoprotein cholesterol (LDL-C) represent a modifiable cardiovascular risk that is routinely tracked by physicians. This measure assesses the percentage of diabetics who received an annual LDL-C screening.

**LDL-C level rate.** This measure assesses the percentage of diabetics who had controlled LDL-C levels (LDL-C $\leq 130$ mg/dL).

**Eye exams rate.** Eye conditions can lead to blindness and are a serious complication of diabetes. The American Diabetes Association recommends an annual dilated retinal eye exam in order to screen for conditions such as diabetic retinopathy and cataracts. This measure assesses the percentage of diabetics receiving an annual dilated retinal eye examination.

**Nephropathy monitoring rate.** Kidney disease is a serious complication of diabetes. The American Diabetes Association recommends an annual nephropathy (kidney) screening in order to determine urinary micro-albumin levels. This measure assesses the percentage of diabetics receiving an annual kidney screening.

**Data**

A centralized data repository of claims and encounters (ie, records of services paid through capitation) supported all HEDIS administrative data queries. The results analyzed in this study utilized the same data used to calculate HEDIS rates reported to the public and to NCQA by participating health plans.

**The Diabetes Disease Management Program**

The DDMP is an ongoing national program that provides members with diabetes information about their disease, support for lifestyle changes, and tools to introduce and enhance self-care practices. The program provides physicians with information about the DDMP and feedback about their individual patients. A centralized, protocol-driven process is used to attain consistency in patient selection, stratification, patient education, and physician interventions across multiple states. Overall program coordination is centralized, but teams of physicians, nurses, case managers, and administrative support staff working under the leadership of the health plan Medical Directors has responsibility for the program execution in local health plans. A free-standing disease management organization (American Healthways Inc., Nashville, TN), working in close coordination with each health plan, has primary responsibility for patient outreach activities. The DDMP patient interventions consisted of repeated, structured interactions with members through mailings; telephonic outreach by trained nurses, dietitians or health educators; web-based tools; and in-person case management. Program content is based on the American Diabetes Association standards of care.14
**Statistical analysis**

The objective of the study was to compare the likelihood that, for each HEDIS measure, results observed in populations exposed to three levels of DDMP intervention had not occurred by chance. Three null hypotheses were formulated as follows:

\[
H_{01}: \text{FP} = \text{NP} \\
H_{02}: \text{FP} = \text{PP} \\
H_{03}: \text{PP} = \text{NP}
\]

Since the objective was to compare two populations and the data type being examined was qualitative, both non-parametric z-tests and the estimator of \( p_1 - p_2 \) were used to examine the significance of any observed differences in tests of proportion. The rejection of the null hypotheses was based on \( p \)-values of <0.05 of the z-test statistic.

**RESULTS**

HEDIS results from 20 health plans for five measures (HbA\(_1\)C Testing Rate, HbA\(_1\)C Control Rate, LDL-C Level Rate, Eye Exam Rate, Nephropathy Monitoring Rate) and 19 health plans for one measure (LDL-C Screening Rate) were analyzed according to DDMP participation status. Due to the option to rotate, in which the NCQA allows a health plan to use the prior year’s reported rates to reduce the medical record review burden on the health plan, some health plans either did not receive a sample, requested and received a significantly smaller sample, and/or did not complete the necessary medical record review and were therefore excluded from this analysis.

Of the 47,547 data points extracted from random samples of 7,993 members (one measure sample of 7,582 members across 19 health plans) whose charts were reviewed, 29,373 (61.8%) measurements were from FP, 4,635 (9.7%) from PP, and 13,539 (28.5%) from NP. These proportions are similar to the known population-based participation rates in the DDMP for the entire HMO and POS MCO membership, and confirmed that HEDIS sampling routines are representative of the entire eligible population.\(^{15}\)

The combined compliance rate results by HEDIS measure and duration of DDMP participation are shown in Fig. 2.

The overall national compliance rate across all six combined HEDIS quality measures was 65.6% among full-participants (FP), 58.4% among partial-participants (PP) and 57.0% among non-participants (NP). The overall national compliance rate is statistically significantly higher among FP than PP and FP than NP (\( p < 0.001 \)) and superior but not statistically significantly higher among PP and NP (\( p = 0.108 \)).

The national compliance rate was statistically significantly higher among FP than PP and FP than NP in each of the six HEDIS quality measures (\( p < 0.001 \)). Results by level of participation showed higher rates among FP than PP in four of six measures (HbA\(_1\)C Testing Rate, HbA\(_1\)C Control Rate, LDL-C Screening Rate, and LDL-C Level Rate). These differences were statistically significant to various degrees. Eye Exam and Nephropathy Monitoring Rates showed a statistically significant difference between FP and NP, but PP rates fell between FP and NP rates, of which only the Eye Exams Rate was statistically significant.

**DISCUSSION**

Comprehensive, multidisciplinary disease management programs have been shown to produce improvements in quality of care, but with few exceptions,\(^{16,17}\) most of these interventions have been delivered in person and have therefore reached a relatively limited number of patients.\(^{18-20}\) In this study, it was demonstrated that, under “real-world” conditions, patients with access to a comprehensive DDMP, which delivers supportive care remotely, experience better quality of care as measured by diabetes-related HEDIS measures. The study also shows that participation in the program for longer than the initial intervention (6 months) results in incremental improvements in HEDIS rates in four of six quality indicators. This argues in favor of interventions that span at least 6 months. It is possible that repeated interactions between patients and care managers are needed before patients assimilate program teachings.
The reasons for the absence of a “dose-response” for Eye Exam and micro-albumin testing (Nephropathy Monitoring) among partial-participants are not apparent from this study. It is possible that our methodology is less likely to detect changes in rates for tests that are usually ordered by physicians only once a year, whereas HbA1c and LDL-C testing are more routinely monitored throughout the year. In other words, it could be a time-sensitivity issue, in that partial-participants may have just received the exam prior to their DDMP commencement or will be receiving the exam after the study period.

The significance of this study is at least twofold. First, by using HEDIS measures as a standard quality indicator, comparing results across health plans in different geographic areas and with other health plans engaged in similar population health initiatives is possible. Second, the scale of a program that reaches tens of thousands of patients quickly and cost-effectively means that disease management is an effective tool for disseminating evidence-based practices broadly. When results from these HEDIS samples are extrapolated to the entire population who participated in the MCO’s DDMP, the estimated number of additional patients receiving this recommended care is in the range of 7,000–13,000.

A comparison of these results with other studies is not possible since, to date, no other study has examined the effect of duration of program participation on quality results. Since an MCO’s performance is often measured by its HEDIS scores and accreditation status, the findings from this study are important in the formulation of health benefits that include coverage of, at minimum, DDMP activities.

The economic implications of improved quality care for patients with diabetes are also noteworthy. Previous studies have demonstrated a positive correlation between improved HbA1c levels and lower utilization of health services,21 improved productivity, reduced absenteeism, and higher retained employment.
Potential biases

Potential biases to the results presented here include the following:

1. Participants in the DDMP are more likely to be compliant with standards of care for reasons other than the DDMP program. This seems unlikely because all patients in fully insured programs have *de facto* access to the program, removing the influence of a particular bias for or against program participation. In general, over 95% of patients with the DDMP benefit participate in it. Among self-insured companies, coverage for DDMP is decided upon by benefit administrators, usually without detailed knowledge of the prevalence or severity of diabetes among their own employees or compared to other companies. In other words, coverage is more an administrative decision than a “public health” decision by benefit administrators and therefore less likely to be biased for or against likelihood of adherence to recommended standards of care.

2. Companies that provide DDMP coverage represent employers who value employee health and perhaps even promote it beyond the availability of the DDMP. Additionally, companies that provide DDMP coverage may have a more highly paid work force and/or provide a richer benefit design (eg, lower co-payments, drug coverage), which may inherently make compliance rates better. The fact that NCQA has no requirements regarding benefit design in the HEDIS sampling mitigates against this potential bias.

While these explanations are possible, only prospective randomized controlled trials (RCT) can provide clarity about the outcomes of full-scale DDMP programs, but RCT’s can be expensive and sometimes logistically difficult to implement.

In summary, this study demonstrates that by using HEDIS quality measures, a nationally accepted standard indicator of quality, participants in a comprehensive DDMP, regardless of level of participation, fair better than non-participants in terms of higher diabetes-related HEDIS rates and that those with sustained participation (>6 months) benefit the most.

REFERENCES


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